

NOAA AQUACULTURE

DRAFT 5-YEAR STRATEGIC PLAN (2023-2028)

Introduction

Who We Are

NOAA's aquaculture activities, collectively known informally as the NOAA Aquaculture Program (Program), are conducted in three NOAA Line Offices, each with distinct and complementary roles - NOAA Fisheries (Office of Aquaculture, Regional Offices, and Science Centers, and several headquarters offices and programs), National Ocean Service (primarily the National Centers for Coastal and Ocean Science, NCCOS), and the Office of Oceanic and Atmospheric Research National Sea Grant College Program (Sea Grant). We have been working together since 2005 to advance sustainable aquaculture development in the United States through [science, service, and stewardship](#).

What is Aquaculture?

[NOAA's Marine Aquaculture Policy of 2011](#) defines aquaculture as the propagation and rearing of aquatic organisms for any commercial, recreational, or public purpose. This definition covers all production of finfish, shellfish, algae, and other marine organisms for: 1) food and other commercial products; 2) wild stock replenishment for commercial and recreational fisheries; 3) rebuilding populations of threatened or endangered species under species recovery and conservation plans; and 4) restoration and conservation of marine and Great Lakes habitat.

Aquaculture is a resource-efficient way to produce protein and it helps improve nutrition and food security in many parts of the world. Global and domestic demand for seafood is poised to grow, and while we continue to sustainably manage our wild harvest fisheries, we cannot meet increasing domestic demand for seafood through those fisheries alone. The farming of shellfish, finfish, and seaweed provides a complementary source of safe, nutritious, sustainable seafood for consumers in the United States and worldwide.

About this Plan

This strategic plan is intended to guide the NOAA Aquaculture Program to help leverage the work by each line office and to reinforce our strong collaboration. The plan lays out a framework to help achieve a robust, thriving, and diverse U.S. aquaculture industry as part of a

resilient seafood sector. The strategic plan is intentionally high-level, but will be followed by a separate implementation plan that will expand on roles and responsibilities, metrics, and timelines for completion.

This plan is designed to help align work conducted across the Program, set priorities to achieve our mission, and support NOAA's vision of healthy and resilient ecosystems, communities, and economies. To meet these needs, this plan includes the following key components: a Vision and Mission to guide our work; our Core Values to illustrate who we are as a program and the philosophy behind how we operate; and four overarching goals which, along with our objectives, outline our highest priorities over the next five years to advance sustainable aquaculture development.

To learn more about what we do go to:

NOAA Fisheries Aquaculture: <https://www.fisheries.noaa.gov/topic/aquaculture>

NCCOS Aquaculture: <https://coastalscience.noaa.gov/research/marine-spatial-ecology/aquaculture/>

NOAA Sea Grant Aquaculture: <https://seagrant.noaa.gov/Our-Work/Aquaculture>

Vision and Mission

Vision: A thriving, resilient, and inclusive U.S. aquaculture sector that supports jobs, expands access to nutritious domestic seafood, and reinforces healthy coastal and ocean ecosystems in a changing environment.

Mission: To provide science, services, and policies that create conditions for opportunity and growth of sustainable U.S. aquaculture.

Our core mission is **to provide science, services, and policies that create conditions for opportunity and growth of sustainable U.S. aquaculture**. Sustainable aquaculture encompasses the “triple bottom line” of environmental, economic, and social sustainability. As the demand for seafood has increased, technology has made it possible to grow food in coastal waters and the open ocean in harmony with a healthy and resilient environment. Aquaculture produces food, jobs, and other commercial products for the U.S. and global economy. Aquaculture can also be a valuable tool for restoring habitat, replenishing wild stocks, and the recovery of populations of threatened and endangered species. Our vision statement captures this broad application of U.S. aquaculture and outlines the benefits that could be derived from achieving our mission.

Collectively, our work also helps advance NOAA’s overarching vision and mission and the priorities identified by our individual offices. The scope of NOAA’s aquaculture activities include providing support for aquaculture for multiple purposes: commercial, recreational, subsistence, and restoration. Advancing aquaculture in these sectors supports the [Department of Commerce Strategic Plan](#), [NOAA’s Blue Economy Strategic Plan](#), the [NOAA Fisheries Strategic Plan](#), [NOAA](#) and [Department Of Commerce](#) aquaculture policies, and the developing NOAA Fisheries National Seafood Strategy. In addition, this Aquaculture Strategic Plan aligns with our commitments to implementing the Strategic Plans for [Aquaculture Research](#) and [Regulatory Efficiency](#) developed by the interagency National Science and Technology Council (NSTC) Subcommittee on Aquaculture (SCA).

Core Values

NOAA’s Aquaculture Program has identified the following Core Values to illustrate who we are as a program and the philosophy behind how we operate. Through these Core Values we will model exemplary service to the American public:



Figure 1: Core values of the NOAA Aquaculture Program’s Strategic Plan: stewardship, scientific excellence, collaboration, diversity and inclusion, integrity and sustainability.

- **Stewardship:** We honor our commitment to the American public as stewards of our shared coastal and marine resources. We deliver results, practice transparency, and strive to exceed expectations.
- **Scientific Excellence:** We employ scientific rigor and innovation to help meet both management and aquaculture industry needs.
- **Collaboration:** We work jointly with a diverse and broad coalition of partners to foster sustainable aquaculture development and communicate the value of positive, transparent, social relationships with our diverse aquaculture community.
- **Diversity and Inclusion:** We recognize the value of, and encourage diversity among our team, communities, and partners as part of our ongoing commitment to equity, inclusion, and accessibility.
- **Integrity:** We conduct our work transparently, ethically, and honestly, earning and sustaining the trust of our aquaculture partners and community.
- **Sustainability:** Our effort to successfully support and grow aquaculture encompasses the triple bottom line of environmental, economic, and social sustainability.

Goals and Objectives

To help achieve our Vision and Mission for domestic aquaculture advancement and instill our Core Values in the work we do, we have identified four strategic goals to address over the next five years: manage sustainably and efficiently, lead science for sustainability, educate and exchange information, and support economic viability and growth. For each goal, we identify the highest priority objectives that the Aquaculture Program will advance in the next five years.

GOAL 1: MANAGE SUSTAINABLY AND EFFICIENTLY

Improve the regulatory system for sustainable coastal and marine aquaculture through collaboration with partners

The existing regulatory framework for U.S. aquaculture is complex and involves multiple agencies, laws, regulations, and jurisdictions. The issuance of Federal permits and grant funding are “federal actions” that require the Federal agency taking the action to fulfill a variety of statutory requirements, including consulting with other agencies when required. More information can be found in the [Federal Guide to Permitting Marine Aquaculture in the United States \(2022\)](#).

NOAA’s role within the federal regulatory framework for aquaculture varies depending on project specifics and relies on effective coordination with our partners, including Federal and state agencies. Within the context of NOAA’s stewardship responsibilities, this includes protecting the marine and coastal environment and the species it supports while balancing regulatory compliance and multiple uses of those spaces.

Permits

- Depending on the species proposed for cultivation, a permit from NOAA Fisheries may be required under the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

National Environmental Policy Act (NEPA) compliance

- Issuing a MSA permit or grant funding requires NOAA Fisheries to comply with NEPA.
- When the U.S. Army Corps of Engineers or the Environmental Protection Agency issues a permit for aquaculture, NOAA Fisheries coordinates with them as appropriate.
- For permits for aquaculture projects in Federal waters where an environmental impact statement (EIS) is determined to be appropriate and environmental review or authorization by two or more agencies is required, NOAA is the lead agency.

Consultations when NOAA Fisheries issues MSA permits or grant funding

- Issuing an MSA permit or grant funding may require consultations with NOAA Fisheries and U.S. Fish and Wildlife Service concerning threatened and endangered species, designated critical habitat, essential fish habitat, marine mammals, and migratory birds under the jurisdiction of the applicable agency.
- Consultation with USDA Animal and Plant Health Inspection Service Veterinary Services is requested for permitted aquaculture operations prior to stocking aquatic animals in coastal and marine federal waters to promote both animal health safety and security.

Consultations when other Federal agencies issue permits

- NOAA Fisheries consults with the U.S. Army Corps of Engineers and the Environmental Protection Agency on their issuance of permits for aquaculture, as required. This may include consultations for threatened and endangered species, designated critical habitat, essential fish habitat, and marine mammals, as applicable.

Other review and authorizations

- Depending on the aquaculture project, any of a variety of other reviews and authorizations may also be required related to aquaculture and ecosystem health, seafood safety and nutrition, protection of maritime navigation, minimizing conflicts with existing uses, and consistency with state and Federal laws.

NOAA works with our federal partners at the national level through the interagency NSTC Subcommittee on Aquaculture, and also collaborates closely with federal and state agencies regionally. This helps to build an efficient, transparent, and predictable framework of regulations and policies that supports environmentally, socially, and economically sustainable aquaculture.

- **Objective 1A - Provide expertise to support the establishment of a clear, efficient, and appropriate regulatory framework for sustainable offshore aquaculture.**
- **Objective 1B - Explore opportunities to support more efficient and equitable pathways for authorizing small scale or time-limited aquaculture activities (e.g. research, commercial trials, or restoration projects).**
- **Objective 1C - Work with states and federal agencies to advance NOAA aquaculture directives**

under existing Executive Orders, policies, plans, and statutes to promote sustainable aquaculture as part of NOAA's seafood portfolio (e.g., SCA's [Strategic Plan To Enhance Regulatory Efficiency In Aquaculture](#)).

- **Objective 1D** - Continue the identification of Aquaculture Opportunity Areas to support planning for commercial aquaculture development in locations that reduce user conflict, maximize compatible uses, and minimize impacts to public trust resources through scientific analysis and public engagement.
- **Objective 1E** - Encourage and support use of best available science, information, and tools (e.g., siting, water quality, and genetics models, peer-reviewed publications) by federal and state agencies to conduct permit reviews, environmental consultations, and develop monitoring requirements and permit conditions.

GOAL 2: LEAD SCIENCE FOR SUSTAINABILITY

Use world-class science expertise to meet management and industry needs for a thriving seafood production sector and share this knowledge broadly

Central to the achievement of our aquaculture vision is to provide leadership for national and international aquaculture science. We will achieve this through funding, conducting, and applying world-class science to address key issues to support the current U.S. aquaculture industry, and to drive its future sustainable development. The NOAA Aquaculture Program engages with diverse partners from across the country and world including academic, local-regional-federal government agencies, non-governmental organizations, international organizations and industry partners, to prioritize and conduct scientific research that is integral to regulatory, management, and business decisions. We are further guided by the SCA's [National Strategic Plan for Aquaculture Research](#), which represents a shared vision for how federal agencies engaged in aquaculture research can deliver the highest priority, complementary science. Across our aquaculture science products and tools, we aim to thoughtfully integrate knowledge and expertise that reflects the diversity of the American people. We are confronting climate change proactively, identifying threats and leveraging resilience and adaptation opportunities. We make our aquaculture science products available to all stakeholders to increase public understanding of aquaculture's environmental, social and economic implications.

- **Objective 2A** - Provide sound, science-based products to support regulatory and management decision-making.
- **Objective 2B** - Conduct coordinated, applied scientific research to support industry development, including innovations to improve industry success.
- **Objective 2C** - Strengthen and diversify aquaculture data collection to support industry management and development.

The table below provides illustrative examples (not comprehensive) of science underway to address these objectives:

Science for Management	Science for Industry Development	Data Science
<ul style="list-style-type: none"> ● Environmental interactions of aquaculture (e.g., habitat, protected species, water quality, ecosystem services) ● Spatial analysis and precision siting, including spatial planning for AOAs ● Social and economic research to maximize societal benefits ● Science advice products to inform NEPA analysis, including for AOAs ● Advance seafood safety and aquatic health management practices ● Operational forecasts informed by changing weather and ocean conditions (e.g., hypoxia, harmful algal blooms) ● Understand climate change effects and resilience/mitigation opportunities 	<ul style="list-style-type: none"> ● Species breeding, rearing, and physiology ● Animal nutrition ● Extension and cooperative work with industry ● Demonstration projects to accelerate aquaculture research and validate performance and reliability for new technology ● Market information and resources for business planning ● Expand climate resilience/adaptation opportunities (e.g., climate resilient species) ● Advanced technology, such as aquaculture gear engineering innovation 	<ul style="list-style-type: none"> ● Continuously improve national aquaculture production statistics, market value, and other industry data collection and quality ● Define and strengthen industry monitoring capabilities ● Integrate and apply NOAA’s latest data collection and analysis technologies (e.g., satellites, UxS (uncrewed systems), artificial intelligence) ● Ensure responsiveness of efforts to regulatory and industry data needs ● Increase data accessibility and usefulness for all stakeholders

GOAL 3: EDUCATE AND EXCHANGE INFORMATION

Build awareness and support for coastal and marine aquaculture through two-way communication with diverse stakeholders and partners

Strong stakeholder relationships, transparent internal and external communication, and outreach activities are critical to the effectiveness of NOAA’s Aquaculture Program. In addition, educating the public about the importance of aquaculture as a sustainable source of domestically produced seafood is important for both the growth of the industry and its acceptance by the public. Providing clear and

accurate information about complex, science-based products and processes will not only support the U.S. aquaculture industry, but also facilitate better understanding of the benefits and challenges of aquaculture for a broad set of stakeholders. Providing ongoing opportunities for input is necessary for results that are driven by stakeholders and will support communities, their economies, culture, and the environment.

- **Objective 3A – Improve public perception and social license for aquaculture by strengthening communication with external stakeholders and within NOAA (i.e., outreach and inreach) to enhance awareness of available resources, expertise, and the current state of science regarding coastal and marine aquaculture.**
- **Objective 3B - Incorporate stakeholder needs into decision-making by seeking feedback on key aquaculture topics using new and existing collaborative relationships (for example, workforce development, technology transfer to industry, financial assistance, environmental interactions, regulatory efficiencies, the culture of specific species, etc.).**
- **Objective 3C – Advance aquaculture literacy by developing, maintaining, expanding, and providing equitable access to concise education and outreach materials. Use these materials to inform stakeholders on the challenges and benefits of aquaculture and the current state of science and the industry.**
- **Objective 3E - Introduce diverse audiences to aquaculture by incorporating new outreach strategies and widely advertising hands-on educational experiences to engage a variety of stakeholder groups.**

GOAL 4: SUPPORT ECONOMIC VIABILITY AND GROWTH

Facilitate a robust aquaculture industry that thrives as a key component of a resilient seafood sector

In order to advance the domestic aquaculture industry as part of the Blue Economy, it is imperative that NOAA maintains partnerships with the aquaculture industry, universities, and diverse communities to assess workforce and economic development needs, and encourages recruitment and business development opportunities that are diverse and inclusive. Workforce development efforts will address industry needs and provide the necessary training and experience in various skills for employees to successfully enter and contribute to the aquaculture industry. NOAA will also work with partners to support access to funding and economic development opportunities more broadly across the aquaculture community, and business tools, including business planning and market strategies, to aid in industry success.

- **Objective 4A - Support workforce development, with a commitment to diversity, inclusion, and accessibility, based on local needs, interests, and capacities. This may include expanding public-private partnerships and associated accessible training programs or stakeholder-based internships to provide relevant skills to support industry.**

- **Objective 4B - Connect aquaculture producers with government programs to enhance access to capital, equitable lending and insurance programs, extension and grants for research and development.**
- **Objective 4C - Work internally to attract, recruit, hire, and retain talented and diverse employees, and promote efforts for similar practices to be followed by the aquaculture industry.**
- **Objective 4D - Explore innovative approaches for fostering growth of early stage aquaculture companies and new technologies for aquaculture production (e.g., innovation incubators or accelerator programs).**

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